

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow.

Claims 1-9 and 11-14 have been amended in a formal way without narrowing their scope. No new matter has been added. Claims 1-14 are pending.

Rejections under 35 U.S.C. § 103

Claims 1-5 and 8-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,388,563 to Brown ("Brown") in view of U.S. Patent No. 5,628,013 to Anderson ("Anderson"). Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Brown and Anderson in further view of JP402118465A ("JP '465"). Applicant respectfully traverses these rejections for at least the following reasons.

Independent claim 1 recites:

1. A safety controller comprising:
a basic module;
one or more extension modules; and
a mother board provided with an extension slot for connecting the modules by a bus; wherein
an input extension module which is one of the extension modules includes one or more input terminal sections capable of connecting one or more safety switches and an input circuit for receiving safety input signals from one or more external input terminal sections,
an output extension module which is one of the extension modules includes an external output terminal section which can be connected to an output control system of a dangerous source and an output circuit for transmitting a safety output signal to an external output terminal section, and
the basic module has an operation program storing part for storing a safety operation program for defining the relation between the state of a safety input signal and the state of a safety output signal on each of types of predetermined safety switches, a type-of-switch setting part for setting an external input terminal section and the type of a safety switch to be connected to the external input terminal section, and an operation program executing part for selecting a safety operation program corresponding to the type of the switch set by the setting part among a plurality of safety operation programs stored in the operation program storing part and executing the program for the external input terminal section set by the setting part.

Brown and Anderson, upon which all the rejections are based, at least in part, fail to suggest either both the input extension module and output extension module as specifically recited in claim 1, or the basic module as recited in claim 1.

Brown discloses a modular emergency stop device 100 including a switch unit 200, and a control unit 300 that can be coupled to the switch unit 200 in a modular manner (FIGs. 1 and 2, col. 3, lines 16-18). The control unit includes stepped terminal blocks 312 (col. 4, lines 44-46). FIG. 6 shows a system that also includes a communications module (col. 8, lines 8-10) or power type converter module (col. 7, lines 56-60).

Brown, however, does not disclose both an input extension module and an output extension module with the specific structure as recited in claim 1. Brown discloses both a modular switch unit 200 and a modular control unit 300. The switch unit 200 of Brown, however, does not correspond to either the input extension module or the output extension module of claim 1. Moreover, while Brown discloses a system in FIG. 6 with further parallel modules, Brown merely discloses that modules such as a power type converter module or a communications module may be added to the system. Brown nowhere suggests that both an input extension module and an output extension module, as those modules are recited in claim 1, may be in its system.

Moreover, Brown does not disclose the basic module as recited in claim 1. In claim 1, the “basic module has an operation program storing part for storing a safety operation program for defining the relation between the state of a safety input signal and the state of a safety output signal on each of types of predetermined safety switches, a type-of-switch setting part for setting an external input terminal section and the type of a safety switch to be connected to the external input terminal section, and an operation program executing part for selecting a safety operation program corresponding to the type of the switch set by the setting part among a plurality of safety operation programs stored in the operation program storing part and executing the program for the external input terminal section set by the setting part.” Thus, the basic module has at least the three components of: (1) “an operation program storing part for storing a safety operation program for *defining the relation between the state of a safety input signal and the state of a safety output signal on each of types of predetermined safety switches*”, (2) “a type-of-switch setting part for *setting* an external input

terminal section and *the type of a safety switch to be connected to the external input terminal section*”, and (3) “an operation program executing part for *selecting a safety operation program corresponding to the type of the switch set by the setting part among a plurality of safety operation programs stored in the operation program storing part* and executing the program for the external input terminal section set by the setting part.” Brown fails to disclose or suggest any of the components (1)-(3) as recited in claim 1. Moreover, Anderson fails to cure the deficiencies of Brown.

Anderson does not suggest a basic module in Brown having any of the components (1) to (3). Anderson merely discloses a computer system with a number of digital signal processing (DSP) modules for performing a particular task. For example, nowhere does Anderson suggest any type of switch setting part that sets the type of a safety switch to be connected to a external input terminal section, or an operation program executing part that selects a safety operation program corresponding to the type of the switch set by the setting part among a plurality of safety operation programs stored in the operation program storing part. Neither Anderson nor Brown suggests a system where a basic module can set the type of safety switch to be connected, and select a safety operation program corresponding to the switch set from among a plurality of safety operation programs. Thus, even if Anderson and Brown were combined, the combination would not suggest all the features of claim 1.

Moreover, Anderson and Brown do not suggest a system with the flexibility of the controller of claim 1 in allowing for the controller to work with a plurality of different types of switches. The switch setting part and safety operation setting part, by providing for the setting of the type of safety switch and then selection of the appropriate safety operation program from a plurality of such programs, provides for this flexibility. Anderson and Brown, which do not suggest the switch setting part or safety operation setting part as recited in claim 1, fail to suggest the flexibility of the claim 1 controller.

JP ‘465 fails to cure the deficiencies of Anderson and Brown.

The dependent claims are patentable for at least the same reasons as their respective independent claims, as well as for further patentable features recited therein. As just one example, dependent claim 3 recites “the basic module includes a part for executing a

diagnostic program for diagnosing whether a predetermined extension module is set to each extension slot by collating the module identifying information read from an extension slot on a mother board with the module identifying information set to the basic module.” The references applied in the rejection do not suggest this feature of claim 3.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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